REVIEWS.

ART. XVI.—*A Practical Treatise on Fractures and Dislocations.* By FRANK HASTINGS HAMILTON, M. D., Professor of Surgery in the University of Buffalo; Surgeon to the Buffalo Hospital of the Sisters of Charity; Consulting Surgeon, &c. &c. Illustrated with two hundred and eighty-nine wood-cuts. Philadelphia: Blanchard & Lea, 1860. 8vo. pp. 757.

THERE is no subject in the whole range of the practice of surgery which is more important, and more likely to interest the practitioner, than that treated of in the excellent work before us. And, although a lamentable want of knowledge and skill in the treatment of these injuries is undoubtedly often manifested, there is no branch of practice which has more fully and frequently exercised and developed the intelligence and tact of American surgeons. The treatment of fractures and dislocations is as well understood and taught in this country, we believe, as in any other; and the advance in the study of the whole subject has, at least, kept pace with European progress in all that is essential of its theory and practice. Under this view the wonder is that a monograph like this of Professor Hamilton's has not long ago appeared.

It is not our intention by these remarks to underrate the difficulties of the task, or to depreciate the great obligation under which the signal ability and industry of the learned author of the present treatise have placed the whole profession. The fact that it is the only complete one of the kind in the English language, and that, since the times of Desault and Boyer, but one of similar extent has appeared in French, must be regarded as significant as to the magnitude of the undertaking; but this does not afford a satisfactory reason for the deficiency which has hitherto existed in the literature of our own and the mother country. Certain it is that a judicious and available digest of the invaluable experience which has been fully and repeatedly recorded in both England and America, as well as on the Continent, in admirable monographs and papers, was greatly needed.

Dr. Hamilton is fortunate in having succeeded in filling the void, so long felt, with what cannot fail to be at once accepted as a model monograph in some respects, and a work of classical authority. Before going further, let us quote a portion of the author's unpretending preface:—

"The English language does not at this moment contain a single complete treatise on Fractures and Dislocations. The two small volumes of Desault, and the one of Boyer, issued near the close of the last century, and translated into English early in this, may perhaps properly enough have been regarded as complete treatises at the time of their publication, but they certainly cannot be so considered now. The several chapters on '*Diseases and Injuries of the Bones,*' contained in the *Leçons Orales* of Dupuytren, translated in 1846, and the *Treatise on Fractures in the Vicinity of Joints, and on Certain Forms of Accidental and Congenital Dislocations*, by Robert Smith, are invaluable monographs, but neither of them claims to be anything more than a collection of occasional and miscellaneous papers. The writings of Amesbury and of Lonsdale relate only to fractures. Even the justly celebrated quarto of Sir Astley Cooper is no more than what its title plainly declares it to be, *A Treatise on Dislocations and on Fractures of the Joints;* but since the announcement of the present volume, a translation of Malgaigne's great and crowning work on Fractures and Dislocations has been commenced by Dr. Packard, of Philadelphia, and the first volume has been placed in the hands of the American profession. Should the remaining volume be rendered into English, the gap in our literature will be measurably filled.

"Under these circumstances I might have scarcely thought it worth while to continue my labours, already so near their completion, had it not seemed to me that Malgaigne, whose researches have been truly marvellous, had failed in some measure to give a just representation of the observations and improvements which have been made from time to time by my own countrymen.

"The contributions of American surgeons to this department had to be sought chiefly in medical journals, many of which have long been discontinued, and most of which were inaccessible to the great French writer. Even to an American, the labour of exhumation from archives hitherto almost unexplored has not been small; and it is probable that many valuable papers have been overlooked; indeed it is impossible that it should be otherwise.

"I am free to say, also, that I have been encouraged by a hope that my own personal experience, obtained during many years of public and private service, might be of some value to my contemporaries.

"Very little space has been devoted to what is now only historical, except so far as was necessary to correct certain time-consecrated errors, or to confirm and illustrate the practice of the present day; but, by a pretty full report of characteristic examples, selected from more than one thousand cases already published by myself, by copious references to the examples recorded by others, and by a careful exclusion of whatever has not been confirmed by experience or established by dissection, I have endeavored to make this treatise useful both to the student and practical man, and a reliable exponent of the present state of our art upon those subjects of which it treats."

The first of the two grand divisions of the work is devoted, in thirty-five chapters, to fractures; and the second is occupied, in twenty-six chapters, with dislocations. The first seven chapters of the first part treat of general topics, in the following order: 1st. General Division of Fractures; 2d. General Etiology of Fractures; 3d. General Semeiology and Diagnosis; 4th. Repair of Broken Bones; 5th. General Treatment of Fractures; 6th. Delayed Union and Non-Union of Broken Bones; 7th. Bending, Partial Fractures, and Fissures of the Long Bones. The succeeding twenty-eight chapters present us with an extended and elaborate study of the special fractures of all the cartilages and bones of the body, except those of the skull. In part second, the first chapter is occupied with general considerations respecting dislocations, twenty-four chapters are devoted to special dislocations, and chapter twenty-sixth treats of congenital dislocations, these last being very fully considered in seventeen different sections.

Our readers may find themselves already conversant with a large portion of the matter which has been condensed, arranged, and amply illustrated in the first part. It will be seen that the elaborate reports which have been presented in successive years to the American Medical Association, and published in the *Transactions*, as well as other papers of value which have appeared in the *Transactions* of the New York State Medical Society, and in this and other medical journals, have been embodied in his systematic treatise. The reputation acquired by Dr. Hamilton through these various contributions, and the extensive researches which he has been long engaged in on account of his important study of deformities after fracture, have aroused an interest in the resulting volume on fractures and dislocations, which must insure a prompt success to it as a scientific publication. In fact, the position of the work and of its author is so well established, and many of his views and inferences, as expressed in different chapters, are so familiar to the profession generally, that we may be excused from dwelling on many matters which might otherwise require some notice.

It is scarcely necessary to remark that Dr. H. has brought together in a lucid, compact, and convenient form, a great deal of information which is drawn, not only from an unusually wide range of reading, but a large amount of personal experience and laboriously careful observation. The numerous published cases and authorities, which are faithfully described and cited, and the considerable number of new cases, introduced throughout the volume, would afford invaluable assistance to the student and practitioner, were it only in clinical illustration of the department of practice which they are intended to portray. But the characteristically independent and ingenious comments with which they are accompanied, and the generally clear and full directions as to diagnosis and treatment, which are added by our author, render his book as instructive and reliable in its teaching as it is interesting and authoritative in its narrative and literature. In short, although some of the cases are not altogether satisfactory, and while in some minor details as to dressings it may not always supply the wants of the beginner, there is very little left undone for all the proper purposes of such a work; so that as a guide for students of every class, as a means of reference for all grades of practitioners, and as an index and a model for other writers on its different topics, it must long continue among the best of its class in our language, if not without a superior in any other.

We have been much interested in the introductory chapters, and would recommend them to the particular attention of the young practitioner. He may safely depend upon them as replete with sound doctrine, and as affording many easily comprehended practical precepts and very important guiding principles. The first of these chapters contains a clear and concise account of the different forms of fracture, as divided and defined in accordance with English and American established usage. In these definitions Dr. H. very prudently takes the nomenclature as he found it; and, although he refers to the logical superiority of the French interpretation of the terms simple, compound, and complicated, as designating fractures, he avoids incurring the risk of crippling his phraseology, in a vain effort to substitute the foreign idiom for our own. Chapter II., on the general etiology of fractures, presents several interesting cases of intra-uterine fracture. Chapter III. is very instructive, and especially important to the learner, while it is well worthy of careful study by experienced surgeons. Among other practical hints of moment, we may refer especially to two. In discussing the difficulty and occasional impossibility of producing crepitus, he says:—

> "Whatever mere theorists may say to the contrary, and notwithstanding surgeons up to this time have rarely ventured to allude to this subject, the fact is so that we do not usually 'set' broken bones. We do not, even at the first, bring them into complete apposition unless it is as the exception. I speak of bones once completely displaced by overlapping, and these constitute the majority of examples which come under the surgeon's observation." (p. 42.)

On the next page he quotes Malgaigne, to the same effect, in the following words:—

> "Second. That overlapping is the most stubborn of all. Here I will add a disagreeable truth, which classical authors have kept too much out of sight,

namely, that it is so stubborn that in an immense majority of cases the efforts of art are unable to overcome it."—*Traité des Fractures et des Luxations*, t. i. p. 102.

There is no greater bugbear among patients, or source of fallacy, vexation, and injustice among surgeons, than this idea of "setting" broken bones; and it is very satisfactory to find it so unceremoniously handled by our author. In thus again fulfilling his well known mission, the reporter on deformities from fractures renders a service to the future members of the profession which has not been without effect upon his older brethren. Few surgeons will demur to his proposition, as broadly stated, but it need not be looked upon as involving any serious reflection on the sufficiency of our art. It simply admits a very natural truth, which ought to be acknowledged by every reasonable person, out of the profession as well as in it, that no one should expect a bone once badly broken to be restored by human intervention to the integrity originally conferred upon it by Almighty power. The true aim is to effect as near an approach to restoration as usefulness and ordinary appearances may require. It is the lack of this usefulness and tolerable contour, only, that constitutes the lameness and deformity which are to be reprobated; and, even here, the nature of the injury, and the attendant circumstances, must alone determine the amount of deviation from the original condition which should be regarded as excusable. The investigations and statements of Dr. Hamilton have already done much towards the removal of the misconception and embarrassment attendant on this question; and it is to be hoped that he may succeed, if such a thing be practicable, in erecting something like a standard which may be generally agreed upon for the protection and satisfaction of all parties who may hereafter be involved, either as plaintiff or defendant, in the miseries of a prosecution for "malpractice."

The next point to which attention may be invited is less novel in its character; but it is still more important in its bearings, since it refers to the mode of examining a fracture, in making out the diagnosis. Our author's advice is so good and so well expressed, that we quote the concluding paragraphs in full. They may be read with advantage by every one, at the same time that they afford a fair idea of his style and mode of teaching.

"I cannot dismiss this subject without calling attention to the necessity of exercising care and gentleness as well as skill in the examination of broken limbs. Nothing, in my opinion, betrays a lack of judgment as well as of common humanity on the part of the surgeon, so much as a rude and reckless handling of a limb already pricked and goaded into spasms by the sharp points of a broken bone. It is not enough to say that such rough manipulation is generally unnecessary, it is positively mischievous, provoking the muscles to more violent contractions; increasing the displacement which already exists, and not unfrequently producing a complete separation of impacted, denticulated, transverse, or partial fractures, which can never afterwards be wholly remedied; augmenting the pain and inflammation, and not unfrequently, I have no doubt, determining the occurrence of suppuration, gangrene, and death.

"In proceeding to establish the diagnosis in any case, the surgeon should sit down quietly and patiently by the sufferer, so as to inspire in him from the first a confidence that he is not to be hurt, at least unnecessarily. He ought then to inquire of him minutely as to all the circumstances immediately relating to the accident, in order that he may determine as nearly as possible its cause, which alone, to the experienced surgeon, often affords presumptive, if not conclusive evidence as to the nature and precise point of the injury. From this, he should proceed to examine the disabled limb; removing the clothes with the utmost care by cutting them away rather than by pulling; and, when completely exposed, he should notice with his eye its position, its contour, the points of abrasion, discoloration, or of swelling; and not until he has exhausted all these sources of information, ought the surgeon to resort to the harsher means of touch and manipulation. Nor will his sensations guide him to the point of fracture by any other method so accurately as when, the patient being composed and his muscles at rest, he moves his fingers lightly along the surface of the limb, pressing here and there a little more firmly, according as a trifling indentation or elevation may lead him to suspect this or that to be the point of fracture. If the skin is more than usually tender, a few drops of sweet oil or of fresh lard laid upon its surface, or even moistening the skin with tepid water, will render this examination less painful, whilst it will facilitate the diagnosis, by rendering the tactile sensation somewhat more acute.

"The limb, in case of a supposed fracture of a long bone, may now be measured with a tape line, and compared with the opposite limb, having first marked with a soft pencil or with ink the several points from which the measurements are to be made.

"Finally, if any doubt remains, the limb must be firmly but steadily held while the necessary manipulations are performed, for the purpose of ascertaining the existence of mobility and of crepitus. Mobility is most easily determined by giving to the limb a lateral motion, but in general, crepitus is most effectually developed by gentle rotation. If the place of fracture is already pretty well declared by the previous examinations, the surgeon should place one finger over the suspected point, during this manipulation, by which means the crepitus will be more certainly recognized.

"I do not often find it necessary to resort to anæsthetics for the purpose of insuring quietude and annihilating pain in making these examinations, since it is seldom that the patient need to be much disturbed; but if the examination is not satisfactory, and the diagnosis is important, I do not hesitate to render the patient completely insensible, after which the questions in doubt may be more thoroughly investigated and perhaps definitively settled.

"It is scarcely necessary to say that the earlier the examination is entered upon, the more readily will the diagnosis be made out; and if, unfortunately, some time has unfortunately elapsed before the patient is seen by the surgeon, and much swelling has taken place, the examination is still not to be omitted, and whatever doubts remain we must endeavour to remove by repeated examinations made from day to day until the subsidence of the tumefaction has brought the surfaces of the bone again within the reach of our observation." (pp. 43–4.)

Chapter IV., on the repair of broken bones, is highly interesting also, although Dr. H. does not profess to enter into a very full consideration of the process. There is, nevertheless, much characteristic and positive knowledge afforded in his discussion of the practical relations of the subject, and as complete and satisfactory an exposition as need be looked for, of what we really know in relation to a question which appears to have been overloaded with a very troublesome amount of speculation. As our author's views on these subjects are already well known, it is unnecessary to dwell upon them here. Instead of quoting the six different paragraphs in which he describes at length as many different modes of union, we give his summary in the following words:—

"In short, we conclude that fractures of adult human bones, whether placed end to end or overlapped, unite most naturally and most promptly either immediately or mediately, and in the same manner that soft tissues unite; that is to say, without the interposition of any reparative material, or through the medium of an intermediate, permanent callus; and that all deviations from these simple methods are accidental, or the result of disturbing influences." (p. 49.)

The old-fashioned notions about provisional callus, which our author, to some extent, in common with Paget, was instrumental in overturning, are treated, as might be expected, with very little consideration.

"Provisional callus is just as much the necessary result of natural laws as is definitive. It is formed because in that condition of the parts and of the general life its formation was inevitable. Whether useful for the purposes of repair or not, it will under certain circumstances exist. In the repair of certain fractures, provisional callus, it is conceded, seldom occurs." (p. 49.)

Dr. H. exposes the absurdity of regarding that as a "provisional" effort of nature, which is found in action so often where it is not actually needed, and yet does not occur in the cases of the patella, olecranon, and other similar bones, where such provisional arrangement would seem to be especially desirable. Provisional or temporary callus, therefore, "has no final purpose, but is the unavoidable result of certain abnormal conditions," which he specifies as a greater or less amount of irritation occurring in vascular soft parts, which, being susceptible of irritation, are consequently involved in it. He is not so certain as to fractures occurring in children, the observations not having been sufficiently numerous to determine absolutely the laws of repair at this age. He is inclined, however, so far as he may be justified by a few examinations, in the repair of young bone, to accept, with but little qualification, the doctrine of Dupuytren.

The succeeding three chapters are among the best in the book. Chapter V., on the general treatment of fractures, is, of course, the most interesting and instructive, as it is the most important. We need not say that it evinces a large share of judgment and experience, as well as practical skill and ingenuity. The care, precision, and fulness of detail, and clearness and simplicity of language with which its topics are generally discussed and the various practical rules laid down, are well calculated to increase our confidence in the subsequent portions of the volume. We are much pleased with many of his ideas, and have no hesitation in accepting his counsels as reliable throughout. Although liberal towards opposing views, he is none the less decided in delivering his own, wherever really important, at the same time that he is abundantly conservative.

Something more, perhaps, as has been already intimated, might have been occasionally said in regard to the mode of manipulating and to the application of rollers, splints, and other appliances, although such elementary instruction belongs rather to the works on bandaging and minor surgery. Our author seems to expect the necessary tact to have been already acquired by his readers; and hence merely alludes to the indispensable qualifications of a dresser, without dwelling on the mode and course of training by which these qualifications may at least be very much improved, if they cannot be developed. It may here be remarked that the same tendency to take a certain amount of practical knowledge for granted in the reader is observable in some of the descriptions of the modes of dressing special fractures. Greater particularity may not have been compatible with the author's plan, and a natural desire to limit the size of his volume; but, while inclined to yield to his better judgment, our desire is, nevertheless, to put in a plea for the benefit of the untrained practitioner, since, with very little direction, in addition to what the author gives, even the tyro might be enabled to dispense with the otherwise necessary assistance of less desirable preliminary teachers.

A few of the points which have attracted our attention in this chapter may be briefly noticed. After cautions in regard to the handling of the broken limb, Dr. H. lays down the rule, as, with certain explanations, one rarely to be departed from, to restore the displaced fragments to their nearest practicable apposition as soon as possible after the occurrence of the injury. Excellent reasons are given for *avoiding* the questionable practice of waiting blindly for the subsidence of the often trifling irritation and inflammation before the coaptation is attempted. He justly considers it important to effect the reduction and comparative repose of the broken limb, in time to anticipate, and, in some degree, prevent, the inflammatory action; but he does not pretend to advocate a resort to the violence which would be inevitable in an attempt at complete reduction after the injured parts had become seriously excited, under the prolonged irritation of the displaced and unsupported fragments. Nor does he urge the application of the dressings, except for mere support, so long as this unfortunate state of things continues. In this he only obeys the rational precept of Hippocrates, and adopts the practice of most hospital surgeons, including Malgaigne, whose refinements on the subject do not seem to please him. The use of anæsthetics, in some cases, gives the practitioner of the present day a material advantage over his predecessors in the reduction and proper dressing, as well as in arriving at a diagnosis in fractures. We are glad, also, to find that Dr. H. does not approve of the employment, except in rare instances and for especial purposes, of any kind of bandages next to the skin. In objecting to the resort to roller dressings under the splints, as often injurious and generally useless for any purpose not attainable in the adjustment of the splints, he justly regards the former as more dangerous than the latter. A careful and experienced surgeon may sometimes do better for some fractured limbs with the primary bandage than without it; but most young surgeons would act more wisely in following Dr. Hamilton's precepts.

The various materials for splints are mentioned, with comparative appreciation of each kind. Of these Dr. H. prefers plain straight strips of wood, carefully padded with cotton batting, and the gutta-percha. He does not fancy metallic splints, except the wire gauze as improved by Dr. Bauer; nor is he an admirer of the many sophistications and delusions in the shape of patent carved splints and beautifully jointed apparatus. Pasteboard, binders' board, leather, bark, felt stiffened with shellac, and even old hat in an emergency, are approved of as often useful. He prefers the gutta percha as more available, on account of its malleability in the warm state and stiffness in the cold, and gives special directions for its use and mode of application. The immovable apparatus of dextrine, starch, and other similar materials, is fully described, and the different kinds compared. He approves, occasionally, of using the starch bandage, after Suetin's movable-immovable mode—which is to cut the casing open so as to admit of inspection of the limb and readjustment of the fragments—but he objects decidedly to any use of this form of dressing in the early stage of the treatment, and gives the usual reasons for the rejection. In most of the views above alluded to we entirely concur. We prefer a kind of agglutinated bandage, however, which he does not describe. It may be made, as employed by some French surgeons, of the calcined plaster in powder, mixed with warm starch mucilage at the moment of application, and well laid on with a brush; but a still more convenient and efficient method is to mix calcined plaster with pulverized gum Arabic, in the proportion of one part in bulk of the latter to about twelve parts of the former. This last-named compound is to be made into a liquid paste with a small quantity of water, and quickly laid on with a large varnish-brush, in the usual manner, before it has had time to set. It is sufficiently elastic, smooth, firm, light, dries promptly, is easily cut, and having a polished surface, is readily kept clean.

Chapter V. ends with a few paragraphs in relation to compound fractures. His remarks on the subject are excellent, so far as they go; but it is to be regretted that he did not devote a separate and entire chapter, instead of two or three pages, in different places, to the consideration of this often most embarrassing form of double injury. There is so much to be said, and yet so little, generally, to be found on this topic, that we are surprised that Dr. Hamilton did not seize the opportunity to fill a blank which the young practitioner meets in nearly every work on surgery.

Chapter VI. is a well-arranged and comprehensive dissertation on retarded union and ununited fracture. A very complete sketch of the subject, together with a copious array of references and a summary of indications for the treatment, is presented in this chapter, for much of which the author acknowledges his obligation to the well-known and often-quoted monograph of Dr. G. W. Norris, published in this journal in 1842.

The seventh and last chapter of the introductory series is an instructive essay on bending, partial fractures, and fissures of the long bones, in which are given the result of a good deal of original investigation, experimental as well as clinical, in addition to a full share of critical inquiry. As this article has already been published and very generally noticed, it is unnecessary to dwell upon it here, except to say that the author agrees with Malgaigne in doubting the reality, as at least not demonstrated by dissection, of permanent bending of bone without more or less partial fracture of the sub-periosteal fibres.

A disproportionate share of attention has perhaps been given in the foregoing paragraphs to the preliminary portion of Dr. Hamilton's work. It is certainly an interesting one, however, and must necessarily have a material influence in determining an estimate of the value of the treatise. Our confidence in the accuracy and usefulness of the subsequent special applications of the principles announced in the early chapters, is fully justified by the soundness of those principles, as well as by the manner in which they are set forth. We cannot undertake the task of discussing many of the points which we have noted in looking through the very interesting chapters on the different fractures and luxations. They can be fairly comprehended only through a careful study in the pages of the book itself; and we take pleasure in recommending such a study to every member of the profession who may be exposed to the grave responsibility of treating the always distressing and too often seriously compromising injuries which are therein forcibly, carefully, and concisely explained and their proper treatment, under all probable contingencies, pointed out.

The chapters on fractures of the jaw, of the vertebræ, and of the clavicle, among those of the smaller bones, have especially interested us; and it is gratifying to find that the labours and progress of our countrymen are exhibited and discussed with much industry and candour, as well as independence of practical appreciation.

With regard to fractures of the vertebræ, whether of the bodies or processes, Dr. H. decidedly objects to operative procedures of all kinds, and recommends a palliative treatment, which we agree with him in regarding as the only safe one; nor does he neglect to remind us that very important assistance and alleviation may be afforded by the surgeon.

Under the head of prognosis of fractures of the ribs, he rather surprises us with the remark that "death occurs sooner or later in a pretty large proportion of the cases in which the ribs have been broken." This statement is not in accordance with our own impression derived from reading and a considerable amount of public and private experience. Some statistical evidence in support of such a proposition is surely needed. Certain complications of fractured ribs are obviously very serious, but it is hard to believe that one of the most common forms of fracture is so often dangerous in the extent of violence produced; and there is reason to suspect that even the proportion of bad complications, which would seem to be referred to, is somewhat overrated by our author. There is little doubt, at all events, that simple fracture of the ribs ought not to be subjected to this alarming imputation without a decided qualification as to the danger being due to the mischief done, at the same moment, to the viscera of the chest, or to other parts. In the treatment of fracture of the ribs, Dr. Hamilton prefers the band or broad roller to the more recently devised expedient of semicircular adhesive strips. He objects to the latter as too liable to become loosened, after a few hours, by the slight but uninterrupted play of the ribs. We regret this, because we are satisfied that he is in error. There is no comparison between the comfort of the adhesive plaster dressing, carefully applied on the affected side, and that of the old-fashioned circular bandage; nor is the latter by any means equal to the former in permanence, if it be in actual efficiency. We have so often seen the superiority, for all essentially practical purposes, of the plaster over flannel or muslin, that we should insist upon its trial in all cases, and especially in the complicated forms. The circular adhesive bands are less apt to slip, or to yield, than the circular bandage; and hence their application around the chest may be desirable sometimes instead of the semicircular strips, which are applied only to the injured side. This latter plan, however, is vastly more comfortable and very often all-sufficient, as it does not require as much attention as either of the other bandages, and can almost always be applied so as visibly to check the action of the ribs under it, while the movement on the other side is very little altered. The plaster dressing has long been known to be almost equally efficient, when properly applied, in the treatment of fractured clavicle, being assuredly less likely to slip, except perhaps in very warm weather, than ordinary muslin or flannel rollers; but it is disagreeable to the patient, and troublesome to the surgeon; and this disadvantage is not only greater than in the application to the chest, but it is not compensated for by an adequate increase of comfort and security in the retention of the parts concerned.

Whatever the kind of retentive means employed, the patient ought to be confined to his bed during the early portion of the course of treatment for fracture of the ribs. This rule must necessarily vary according to circumstances, but should admit of very few exceptions for the first few days, and is imperative where no bandage can be borne. The advantage of the supine position—with only a large, well-stuffed pillow, too—is very striking in the treatment of fractured clavicle, and in none more so than in displacements of the fragments of this bone which are otherwise unmanageable. We have seen this demonstrated often enough to have acquired more faith in the simple method of Hippocrates than in the best of the modern contrivances, whether the patient be young or old, and especially if young, notwithstanding the well-known difficulty in confining these two classes to their beds. Dr. Hamilton reminds us that the treatment by the recumbent position, with or without a pad or small pillow between the shoulders, and with or without a bandage or other supports for the arm, is, and has been a favourite one with many surgeons on both sides of the Atlantic and the British channel. We prefer combining the occasional use of Fox's apparatus, as a *placebo* no less than an additional support, with position on the back, in most of the easy and all of the bad cases. It is probable that the importance of bodily repose in every case of fracture, during the inflammatory stage, is not sufficiently attended to. In short there is not a fracture in any part of the frame in which the patient would not be safer in bed than out of it, and a material gainer by the additional restraint, for at least a week after the reception of the injury, and in many cases for a longer period.

The views of Dr. Hamilton in regard to the rarity of cures, without more or less displacement, of certain fractures of the clavicle, are well known and doubtless very generally agreed to. His chapter on this variety of broken bone is able and interesting, replete with learning and yet eminently practical. The author fully sustains his position as to the persistence of a certain amount of deformity after these fractures, and gives a very instructive history of the various theories and modes of treatment advocated from the time of the father of medicine and surgery to the present day. He presents two cases, in conclusion, which incline him to the belief, along with many surgeons of experience, and in which we fully coincide, that the recumbent posture on the back may secure as good a result, in many cases, as any form of apparatus.

He describes and represents an apparatus of his own, however, which is a modification of that of Dr. Fox, and would seem to be perhaps rather more efficient, and therefore an improvement; although it is scarcely equal to the convenient and complete contrivance of Dr. R. J. Levis, which he does not even mention. The deviations in Dr. Hamilton's dressing from the arrangements of Fox's apparatus, which we have seen employed in the Pennsylvania Hospital, and have resorted to ourselves, are scarcely sufficient to distinguish it as anything more than one of the numerous variations, like the neat and ingenious one of Dr. Levis just alluded to, of the ordinary form. The excellence of the typical apparatus, as contrived by Drs. Washington and Fox some thirty years ago, in the Pennsylvania Hospital, and first described by Dr. Geo. Fox (*Philad. Med. Exam.*, March, 1838, p. 108), is admitted by our author. He refers also to a very similar combination of sling, pad, and ring, which has been at least as long in common use in England, and which is probably the apparatus designated by Mr. H. T. Chapman (*Atlas of Surgical Apparatus*, London, 1832, pl. viii.); but he very properly, as we think, refuses to allow, what it would be difficult to prove in any fracture apparatus, that this dressing completely answers all the indications in a majority of cases. A needless amount of space, however, is expended by our author on the discussion of its merits, as claimed to be established in the use of it at the Pennsylvania Hospital. The apparent difference of opinion as to the curability of fractures of the clavicle, which seems to have exercised him, was one of words more than of actual doctrine, since the extravagant expressions in the works of Drs. Smith and Sargent were too vague and sweeping to justify the amount of importance awarded to them in the present volume. In the course of the last twenty years, we have seen repeated instances of more or less deformity, as well as others in which there was no perceptible displacement left, after fracture of the clavicle in cases treated at the Pennsylvania Hospital. We have witnessed them in private practice also, after the careful employment of the sling and pad of Fox. For years past we have been in the habit of altering and adding to the apparatus, according to the requirements of individual cases; and never have regarded it as either perfect in its operation or stereotyped in form and character. And yet, with the ordinary qualifications, in speaking of the dressing of a notoriously unmanageable form of fracture, it was surely fair enough to say that "the chief indications in the treatment of fracture of the clavicle are perfectly fulfilled by the use of this apparatus." All that can be—and, probably, is—claimed for it is, that, in skilful and attentive hands, it accomplishes as much as any other mere apparatus; while it is more available, because more easily constructed, more easily watched and readjusted, and less irksome to the patient.

No public hospital should be held responsible for particular forms of apparatus or modes of treatment, without a precise and formal recognition of that responsibility by the surgical authorities of the institution interested. And we would be sorry to believe that the hospitals of the country were not all of them sufficiently progressive in their operations to admit of the continual resort not only to minor adaptations of old means and appliances, but to entire changes, when properly suggested. This has been the custom in the Pennsylvania Hospital; and it will doubtless continue, with respect to fractures of the clavicle as to other lesions. Indeed, we happen to know that in the course of the last few years six different kinds of dressings have been tried in fractured clavicle alone in that hospital, some of these having been repeatedly employed. Under this impression we regret to see it stated, in a work of such authority as this, that since the introduction, in 1828, of Fox's Apparatus into the Pennsylvania Hospital, "no other has ever been used in that institution for the treatment of broken clavicles." (p. 199.)

Fractures of the extremities, as might well be expected in such a work, are very thoroughly and honestly discussed, and at the same time illustrated with many interesting cases, and numerous engravings. No one can study our author's very able and elaborate exhibition of the history, diagnosis, prognosis, pathology, and treatment of fractures in the shafts and joints of these all-important locomotive organs, without acquiring a greatly increased confidence in the various resources of our art, as well as a much higher estimate of the enlightening influence of true science upon a branch of practice which is too often regarded as the province of the empiric and the mechanician. We have read his chapters on fractures of the arm, shoulder and elbow, the forearm and wrist, the hip-joint, the thigh, knee, the leg, and the ankle, with great interest and care, and have noted many views and facts as entitled to particular attention. We are, however, obliged to forego the satisfaction of remarking upon these and of venturing to express some difference of opinion in relation to a few of them; and are forced to confine our notice to a very cursory view of the remainder of the volume, notwithstanding the paramount importance of the topics. We regret this the less, however, because the work is of so much intrinsic value that we are sure it will be in the hands of every American surgeon.

Passing over, therefore, for want of opportunity to discuss their many interesting and frequently novel points, fractures of the scapula, fractures about the head and neck of the humerus, oblique fractures of the humeral shaft, the embarrassing and too often permanently mischievous fractures of its condyles and of the articular heads and apophyses of the adjoining bones of the forearm; passing over, too, the fractures of the forearm, and especially the fractures of the radius in its lower third, including the vexatious and still disputed complications with the carpal joint, we can merely stop to invite attention to a few of the valuable hints afforded by our author.

Among these may be mentioned very useful tabular arrangements of the symptoms or differential diagnosis of fractures and other injuries about the shoulder and elbow-joints respectively. These tables present precise, full, and comprehensive exhibitions of these difficult questions, in so clear and methodical a manner as to bring the diagnosis in all ordinary cases within the reach of every intelligent surgeon. The remarks on the displacements in oblique fractures of the humeral shaft, the author's plan of overcoming them, and the difficulty, not to say impossibility, of maintaining permanent extension, in such cases, are also highly interesting. Still more so are the observations in regard to the dangers and causes of anchylosis and deformity of the elbow and wrist-joints; the importance of early resort to passive motion; the cautions in respect to the conduct of this exercise; the danger of sloughing in certain displacements; the impropriety of graduated compresses in the management of fractures of the forearm; the advantages of Lonsdale's supine position in the treatment of these fractures; the treatment of the fractures of the carpal extremity of the radius, in which are discussed the comparative value of the different plans of Barton, Bond, the author, and others, in this country, and of numerous British and continental surgeons.

Leaving the upper extremities, the fractures of the pelvis will be found to be fully considered; and the succeeding chapter (XXVIII.) presents an admirable and most instructive monograph on fractures of the femur. This important injury is here faithfully and minutely studied in all of its varied and difficult aspects. There is probably not so complete and comprehensive, practical and theoretical survey of the whole subject in the English language, and we doubt whether there is any in existence. It is well worth an analysis by itself, and would stamp the character of the book as one of high authority, even if it stood alone in its peculiar merits. By this we must not be understood, however, as subscribing to all of its doctrines, since some of its positions must be regarded as open to discussion. A few matters only can be glanced at, which ought not to be passed by in silence. In the first place, it may be said that, after as fair, full, and close an examination of all the evidence within his reach, and an impartial summing up of the testimony upon the interesting but difficult subject of union within the capsule, Dr. Hamilton arrives at the safe conclusion that "in it all we think we see enough to warrant a belief that under certain favourable circumstances bony union may occur, but not enough to establish it beyond all doubt." So far he is in the position assumed by Sir Astley Cooper fifty years ago, and as we firmly believe, never since successfully confuted. He goes beyond Sir Astley, however, in expressing his scepticism as to every specimen of bony union which he has yet examined. He is entitled to all the benefit of the very reasonable doubt which he so frankly expresses; especially as he does all that he could do for his patients, by giving them the same benefit in making an attempt, by proper treatment, to bring about the consummation which he so slightly expects. The great advantage of treatment, when it can be tolerated, in addition to the approximative union to be hoped for, is, as he intimates, due to the possibility of the existence of an extra-capsular instead of an intra-capsular fracture. We would prefer the careful employment of a modified Hartshorne's splint, one of Gilbert's, the usual Physick and Desault, or Haynes Walton's modification of Liston's splint, with a particular arrangement of extending and counter-extending bands, to the Hagedorn apparatus of Gibson, or the bed of Daniel, which are recommended by Dr. Hamilton. The latter of these two is expensive and insufficient, and the former is not more available, while it is more complicated, and, according to common experience, much more disagreeable to the patient than either of the single long splints just enumerated.

The next point to be referred to is the prognosis, as to overlapping and shortening, in oblique fractures of the femur. The frequent, if not invariable, occurrence of shortening after these fractures, which Dr. Hamilton has demonstrated in his "deformity" reports, has reopened an old question, which has been very considerably discussed since general attention was attracted to it by our author. It does not appear to us that his statements and those of the authors quoted have yet been formally controverted, or that they can be, so far as the mere question of fractions of an inch is concerned, until a much larger number of cases have been recorded for the especial purpose of testing his conclusions. Nor do we think that even then the negative position can have a much better basis than it has at present, which is one of mere opinion, unless some mode of measuring can be established which will meet with general approbation. We are satisfied, however, that, within certain limits which are not easily defined, the result depends more upon the amount of vigilance and good management of the surgeon in each individual case than is made to appear by Dr. Hamilton, or than can be attributed to the nature of the injury or to the particular kind of apparatus used.

It is to be regretted that he has not expressed this idea of relative recovery, at least in such a manner as to protect himself more certainly against being misunderstood by careless readers; since, in the very laudable desire to establish the actual frequency of what he terms deformity, he runs, we fear, the risk of affording mischievous aid and comfort to incompetent pretenders, and a corresponding amount of injurious discouragement to skilful practitioners. The question is not so much one of the difference in fractions of an inch between the dimensions of the reunited fragments of a broken bone and of its uninjured fellow, as it is a question of perceptible disparity between them in shape and function. Notwithstanding the difference of opinion among high authorities as to the effect of a few lines or centimetres of shortening, we should care little about the loss of half an inch in length, or the gain of an inch or two in thickness, provided the patient could walk without a limp, and had escaped without an evidently crooked limb. Arithmetical investigations, supposing the accuracy of measurement to equal the precision of the record of it, are doubtless very useful as perhaps the only unequivocal means of describing a series of definite results; but until the pathological significance of these merely mechanical data in fractures has been positively ascertained by a long series of comparisons with the corresponding amount of impairment of form and function, and by a still longer series of comparisons between the lengths of unbroken limbs, we are not inclined to admit the argument afforded by them as conclusive against the authority of ordinary observation for a more favourable opinion than that expressed by Dr. Hamilton. The extent of permanent damage resulting to a broken limb is surely not much to be regretted, when it requires an examination with the square and rule for its detection.

We have not been able to find any precise directions given by Dr. H. as to the proper mode of measuring, and are therefore somewhat at a loss in regard to his practice in this important matter. He appears, however, to use the tape altogether, since no mention is made of Mayor's dividers or of any other instrument, and the "fixed points" selected are the anterior-superior spinous process of the ilium above, as usual, and the "internal condyle or the malleolus internus" below. (p. 385.) Now unless the numerous measurements appealed to by Dr. H. as confirming his theory of invariable shortening were made with the malleolus internus as the lower fixed point, we should not be disposed to accept them as entitled to attention. If this exception be not in accordance with Dr. H.'s own views, which we can hardly believe, it is certainly sustained by good authority; and at all events it has sufficient force to damage seriously the statistics which may be based upon that mode of measurement. Without taking the time to discuss the comparative value of the malleolus and the internal condyle as recognizable "fixed" points, we shall take for granted that the malleolus was the point selected in all cases by Dr. H. Even then, however, we are not released from doubt, since this only part which is really available as a point, is sometimes not fixed enough to enable the most experienced and expert surgeons to agree upon a measurement, or even to arrive at the same measurement themselves in successive attempts on the same limb. We have known this to be the case with anatomists and hospital surgeons who have been measuring for more than thirty years, and are as well able to arrive at a result as any operator in the world. We have no faith in the minute accuracy of the tape measure, and not much more in that of the dividers. We prefer a wooden or metallic graduated rule, long enough to reach from head to foot, and furnished with sliding cross-pieces, also graduated, like the gauger's measure; but we doubt even this for some cases, on account of the difficulty as to points. But, admitting our certainty of measurement, how are we to be sure that our patients, or some of the other patients measured, were originally symmetrical? We may here present an imaginary difficulty, but insist upon it, nevertheless, until the fact of constant equality of length between the right and left limbs has been established. We are not prepared with positive data as to the amount and frequency of deviations in what are supposed to be healthy frames, *especially in males*, although from the ease with which left-handed persons are recognized by the glovemaker and the shoemaker, and from our knowledge of frequent inequalities in the chest and other parts, we have some very reasonable suspicions on the subject. There is no doubt, however, as to the not uncommon occurrence of inequality from disease, under circumstances, too, which would be likely to mislead attention unless it were suspected. We remember a curious instance of this at the Pennsylvania Hospital recently, in which the sound limb was found to be elongated by a thickened acetabulum. We have heard also of limbs being actually lengthened under treatment for fracture; and, of course, have met with limbs recently fractured on one side, and shortened from old fracture on the other.

In short, although the good effects of treatment in oblique fracture of the femur have undoubtedly been exaggerated, in the desire to vaunt the different forms of apparatus, we see no good reason for denying the fact that immunity may occur sometimes, notwithstanding the average result of the author's 115 observations, and the positive assertion of Malgaigne and others. Whatever value may be attached to the positive view of the question, the many interests involved are sufficiently important to justify the quotation of our author's negative conclusions in his own words:—

> "By a reference to my 'Report on Deformities after Fractures' it will be seen that the average shortening in fractures of the upper third of the femur, in the cases examined by me, was about four-fifths of an inch; in the lower third it was a fraction over three-quarters, and in the middle third a fraction less than three-quarters, of an inch; and the average of the whole number was almost exactly three-quarters of an inch (three-quarters and $\frac{1}{47}$). These analyses were made upon simple fractures, and were exclusive of those in which no shortening at all occurred. An analysis which included also those which had not shortened, reduced the average shortening to half an inch and about one-tenth.
>
> "An examination of cabinet specimens does not present a result so favourable even as this. Of nineteen fractures of the shaft of the femur contained in Dr. Mütter's cabinet, not one seems to have been shortened less than one inch. Specimen B 63, a fracture of the middle third, is united with a shortening of two inches and a quarter; and specimen B 130, imperfectly united after a fracture through the middle third, is overlapped three and a half or four inches.
>
> "In conclusion, I wish to say, briefly, that, in view of all the testimony which is now before me, I am convinced—

"1. That in the case of an oblique fracture of the shaft of the femur occurring in an adult, whose muscles are not paralyzed, but which offer the ordinary resistance to extension and counter-extension, and where the ends of the broken bone have once been completely displaced, no means have yet been devised by which an overlapping and consequent shortening of the bone can be prevented.

"2. That in similar fracture occurring in children, or in persons under fifteen or eighteen years of age, the bone may sometimes be made to unite with so little shortening that it cannot be detected by measurement; but whether in such cases there is in fact no shortening, since with children especially it is exceedingly difficult to measure very accurately, I cannot say.

"3. That in transverse fractures, or oblique and denticulated, occurring in adults, and in which the broken fragments have become completely displaced, it will generally be found equally impossible to prevent shortening; because it will be found generally impossible to bring the broken ends again into such apposition as that they will rest upon and support each other.

"4. That in all fractures, whether occurring in adults or in children, where the fragments have never been completely or at all displaced, constituting only a very small proportion of the whole number of these fractures, a union without shortening may always be expected.

"5. That when, in consequence of displacement, an overlapping occurs, the average shortening in simple fractures, where the best appliances and the utmost skill have been employed, is about three-quarters of an inch.

"If we consider the muscles alone as the cause of the displacement in the direction of the long axis of the shaft, the shortening of the limb, other things being equal, must be proportioned to the number and power of the muscles which draw upwards the lower fragment. This will vary in different portions of the limb, but nowhere will this cause cease to operate, nor will its variations essentially change the prognosis.

"I have not intended to say that other causes do not operate occasionally in the production of shortening, but only that muscular contraction is the cause by which this result is chiefly determined, and that its power will be ordinarily the measure of the shortening." (pp. 403, 404.)

The only remarks we have to make in regard to these conclusions are—1st, that they speak well for the average success of the treatment in the cases examined; 2d, that tape measurements are not certain enough to afford reliable data when quarters of an inch are in dispute; 3d, that, until the rule of conformation between limbs of the two sides of the body is shown to be that of a constant equality in length, the small amount of difference detected in the mechanical survey may sometimes be an imaginary or theoretical rather than a real or practical effect of fracture; 4th, that the question of shortening may be influenced by accidental variation through previous disease or injury, whatever the normal equality may be, and that, at all events, the amount of perceptible lameness may vary in different individuals with the same amount of physical deformity; and lastly, that no amount of negative testimony, such as Dr. Hamilton presents, can overturn the evidence of the positive facts which we are satisfied have been observed. We have not the slightest doubt that oblique fractures of the thigh have been and can be united without observable overlapping or shortening; and that they are not so rarely united without material deformity as our author would have us to believe.

In the treatment of all fractures of the femur, Dr. Hamilton, we think, rightly prefers the straight position. In this he differs from some American surgeons, of authority, who still adhere to the flexed position or the double inclined plane for certain forms of this lesion, although for fractures of the middle third there are very few who now resort to this nearly obsolete plan.

"In my tour of 1844," says he, "during which I visited very many of the hospitals of Great Britain and upon the continent of Europe, I do not remember to have seen the flexed position once employed in the treatment of a broken thigh; and I shall presently show that the straight position is at the present moment very generally adopted by the best American surgeons.

"There have been, then, three grand epochs in the history of the treatment of fractures of the thigh.

"1. That in which the straight position was universally adopted, and which reaches from the earliest periods to the period of the writings of Pott, or to about the middle of the last century.

"2. The epoch of the flexed position, which, inaugurated by Pott, had already begun to decline at the beginning of the present century, and which may be said to have been completed within less than one hundred years from the date of its first announcement.

"3. The epoch of the restoration, or that in which the surgeons, by the vote of an overwhelming majority, have declared again in favour of the straight position. This is the epoch of our own day.

"Although American surgeons have generally adopted the straight splint in the treatment of fractures of the thigh, yet the form and construction of the splint have been greatly varied. The simple long splint of Desault, and the more complicated apparatus of Boyer (Fig. 133), have each their advocates; but it is seldom that we meet with these, or with any other forms of apparatus originally employed in foreign countries, without noticing that they have been subjected to considerable modifications; indeed, most of the straight splints as well as double inclined planes in use at present among American surgeons may fairly be regarded as original inventions." (pp. 406, 407.)

There is little doubt of the originality, so far as the knowledge of the introducer reached, of many of these various contrivances; but we are equally well satisfied that very few, if any, of them present a single mechanical expedient of value which has not been anticipated, in some shape or other, long ago in European practice. The best of them are more or less modified repetitions of older instruments in this country, which, again, are revivals of forgotten predecessors in the old world. The great majority of them have the very serious objection of complexity, which ought to be opposed by every true surgeon; and too many of their devisers add the disgrace and folly of patent-right restrictions to the already heavy burthen of perplexity in application and unnecessary cost of construction. Expense is, of course, a minor consideration in a question of humanity, where anything material is to be gained by the outlay, even for those who are not among the fortunate in this world's goods; but there is no need of hesitation on that score as to the duty of the surgeon in selecting fracture apparatus. Instead of exemplifying the general sense of the insufficiency, for all proper purposes, of the common splints, as Dr. Hamilton supposes in respect to fracture of the thigh, the multiform machines which are advertised to "meet every indication" are quite as apt to be so many inventions of the enemy, to save the labour of the responsible attendant, and to flatter him with the expectation of accomplishing, by means of screws, and bolts, and joints, what his indolence or ignorance would prevent him from doing with the ordinary means. The advantages of simplicity in fracture dressing are so obvious, and the dangers, hindrances, and delusions of a departure from it are so frequent and glaring, that we regret to see some very formidable pictures of these apologies for want of vigilance and skill allotted so large a space among Dr. Hamilton's generally excellent illustrations. They are out of place in such a work, even as examples to be shunned, which, from his preface, we understand to be the part he intends them to perform. Our author is clear enough in his own record and position on the question of simplicity, and we are sorry that any portion of his book is in the least degree exposed to the imputation of being less so than its author. Some of these instruments are certainly ingenious, and creditable to the good intentions of their authors; and, when free from the stain of patenting, may be entitled to notice. This is not the case, however, with others; the inclination of an inexperienced practitioner is so strong to the resort to these often plausible substitutes for intelligent attention to the simple indications, and the temptation to rely upon the supposed mechanical efficiency of the usurping instrument employed, is so injurious, that the less such things are seen in respectable company the better for the profession generally, as well as for their patients.

It has surprised us to find that Dr. Hamilton positively awards to Dr. Josiah Crosby, of New Hampshire, the credit of having brought the use of the adhesive plaster extending bands "into notice, if not indeed of the first suggestion." This is certainly a mistake, unless Dr. Crosby's own account be erroneous. (*Am. Journ. Med. Sci.*, 1854, vol. xxvii. p. 77.) This gentleman claims only to have used it "for the first time in 1849;" that is, at least five years after it had been in constant use at the Pennsylvania Hospital in many cases, and one year after a description had been given of it, with a strong recommendation, by Dr. Sargent in his *Minor Surgery* (edition of 1848, p. 201), and in his American edition (the second) of Druitt's *Surgery*, also published in 1848. Dr. Crosby appears to have presented some account of the adhesive extending bands at the meeting of the New Hampshire Medical Society in 1850. This is noticed in a review of Dr. Sargent's *Minor Surgery* in the *New Hampshire Journal* for August, 1850, which also refers to Dr. Wallace's employment of the strips as described by Dr. S. (See also *N. H. Journ.*, Oct., 1850, p. 65.) Dr. Gilbert, in a paper published in this journal in 1851 (vol. xxi. p. 70), rightly attributed its then comparatively recent introduction into general practice to Dr. Ellerslie Wallace, who had first resorted to it at the Pennsylvania Hospital in January, 1844. (See also *Med. Exam.*, Philad., Dec., 1852.) Dr. Gilbert was preceded by Dr. Crosby only in a paragraph in Dr. Mussey's report on surgery in the *Transactions of the American Medical Association* for 1850 (p. 387), and probably has quite as much right to the credit of success in attracting the attention of the profession to the subject as Dr. Crosby or Dr. Mussey, although neither is entitled to priority of actual publication, and still less to the credit of original invention. The only other claimant is Dr. Gross (*Med. Exam.*, Philad., Nov., 1852), in behalf of Dr. Swift, of Easton, as inventor, and of himself as the promulgator of the practice, in his work on the *Anatomy, Physiology, Diseases, and Injuries of the Bones and Joints*, published in 1830 (p. 50). This last claim is more reasonable, although it rests on a rather slender basis, inasmuch as the only allusion to the subject consists in the mention that the author's preceptor, Dr. Swift, had used two parallel strips of muslin, spread at their upper ends with adhesive plaster, as extending bands in the treatment of certain complicated fractures of the leg, this allusion being followed by a general recommendation of the method as a good one. This statement merely shows that the writer was on the threshold of a valuable improvement, but it does not appear that he pursued it beyond the first step, though this was an exceedingly suggestive one. We are satisfied, however, that Dr. Gross is right in his claim for Dr. Swift, since, as Dr. Wallace has recently informed us, the first employment of the plan in question in the Pennsylvania Hospital was due to a vague hint given him incidentally by Dr. Ennis, a pupil of Dr.

Swift, in which the former merely said that his "old preceptor was in the habit of using sticking-plaster instead of gaiters for keeping up extension in fractured thighs." The idea was soon worked out by Dr. W., and resulted, after many trials, in the arrangement first described by Dr. Sargent. Six months after his first successful experiment Dr. W. again saw Dr. Ennis, and learned from him that Dr. Swift had found that one long parallel strip on each side of the leg, without bandage or circular strips, was all that was needed for the purpose, as they held their places sufficiently under the pressure of the junk bags and splints. This led to the present mode of application, which is erroneously awarded to Dr. Crosby in the report of Dr. Mussey. Dr. Crosby, in his paper, prefers securing the bands with the ordinary circular bandage, according to the original plan of Dr. Wallace. Under the circumstances, it seems strange that the great importance of this improvement of Dr. Swift should not have been recognized and generally adopted, as it is now, long before Dr. Wallace first heard of it from Dr. Ennis. The counter-extending adhesive strips of Gilbert do not seem to have satisfied Dr. Hamilton, who probably under-estimates them as much as Dr. Gilbert may possibly overrate them. We are inclined to think, from what we have seen, that, with care in adjusting them and adapting their width to the size and shape of the parts, and protecting them from moisture, they are more manageable than any other perineal band, and hence a decided improvement, notwithstanding some little practical difficulty in their occasional application. Dr. Hamilton says nothing of the method of resorting to counter-extension from the other thigh, which is sometimes practised in this country, and is recommended in some cases by Fergusson and others abroad.

A plan entirely new to us, and probably undescribed hitherto, has been for some time past in operation at the Pennsylvania Hospital, in the hands of its contriver, Dr. H. Lenox Hodge, one of the resident surgeons. It consists in the application of a broad counter-extending adhesive strap to the front and back of the chest, near the shoulder, of the injured side; these straps are securely confined to the walls of the thorax, by three transverse strips so applied as not to constrict the chest and abdomen, and are then attached to a short and bent iron bar which extends from the upper extremity of the long outside splint, over the shoulder in such a manner as to bring the counter-extending force exactly in line with that of the extending bands below.[1] This application of the adhesive strip is certainly ingenious, and promises well. It is simple, comfortable, and effectual, so far as we can judge from the few cases in which it has been tried; and it may be recommended as an advantageous alternative in many cases, if not a general substitute, for Gilbert's method, as well as for all the older plans. There may be theoretical objections to the manner of making the counter-extension from the chest; but we doubt whether they will be sustained in practice, as there are some positive advantages, in the mode of fixing the trunk, attendant on its employment. We have no hesitation in preferring the maintenance of the extension and counter-extension in the same line, and therefore cannot agree with Dr. Gilbert in his somewhat plausible idea as to the advantage of the oblique over the straight direction for the counter-extending force.

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[1] See "American Intelligence" of this No. for a description by Dr. Hodge, with a wood-cut diagram and sketch. We are now attending a bad case of fracture of the neck of the femur, in which this arrangement has been thus far found to answer remarkably well, and have seen it applied with success in two other cases.

Before leaving this topic, we may as well remark that the use of the adhesive plaster in the treatment of fractures dates back more than forty years ago in Philadelphia, since it is known by former residents at the Pennsylvania Hospital, among whom we may mention Prof. H. L. Hodge, of the University of Pennsylvania, to have been frequently employed in the wards of that hospital, by the late Dr. Joseph Hartshorne, as the only dressing in fractures of the clavicle, and as a protective one to the groin, heel, and other parts, in fractures of the limbs. We remember assisting Dr. Hartshorne, in 1839, in this application of adhesive strips to a case of dislocated clavicle, at the acromial end, and were then told by him of his practice in fracture of the same bone.

So little time is left for the consideration of the second, and, if possible, more important and valuable part (on dislocations) of this treatise, that we pass very rapidly over the remaining pages on fractures.

These, like those of the preceding chapters, are very interesting and instructive, as well as suggestive. Fractures of the patella are carefully discussed, with the usual amount of reference to American experience. The dressing represented and described as the author's mode presents nothing novel in its features. The history and rationale of this fracture, and of its treatment, are not so satisfactory as in the chapter on the same subject by Malgaigne. The clamps of this able surgeon are not noticed, as we think they might as well have been, either in objection or approval; and we think one or two other forms of simple apparatus might have been exhibited, in addition to those of Wood and Lonsdale, and to the very old-fashioned specimen of Dorsey's splint, which is given as the type in common use. The method shown in Wood's apparatus was familiar to us in a simpler form, at least eighteen years ago, in the Pennsylvania Hospital (*Phil. Med. Exam.*, March, 1842, pp. 202–3), without being considered novel then.

We agree entirely with Dr. Hamilton in the opinion that too much confidence has been placed in the efficiency of "Dupuytren's splint" in fractured fibula. He believes, "indeed, that this splint ought generally to be preferred as a means of support and retention after this accident, and I have myself usually employed it; but I doubt whether it is able to accomplish more than a moiety of all that its illustrious inventor proposed." We have seen fractures followed by deformity, notwithstanding great care and the faithful resort to Dupuytren's expedient, and we have seen many others get well without any trouble in the ordinary fracture-box. We have seen a very bad fracture of the lower third of the fibula recover without deformity under treatment in Pott's position on the injured side, the leg and foot being maintained at rest in a narrow fracture-box, adapted to the part. This fracture-box was a somewhat rude form of the splint which Dr. Hamilton recommends in applying Pott's method to the treatment of fractures of the tibia and fibula, which he prefers, without meaning to make an arbitrary or invariable rule, in "probably nine-tenths of all simple fractures of the leg." In most cases this plan, whether for one or both bones, of treating fractures of the leg by the flexed position on the outside, may, doubtless, answer very well, and in some cases better than that of the ordinary position on the heel and calf, in splints or fracture-box, whether they be suspended or not. There are not many cases of painful or excoriated heel, however, that would not be manageable either by suspension or in bran, or with a bran or sand cushion. According to Mr. Skey, the position on the side, which was formerly common at St. Bartholomew's, has long been abandoned there in favour of the position on the calf, as more uncertain than the latter. Nor have we the dislike or distrust of the fracture-box which is expressed by Dr. Hamilton; in good hands it may be relied upon for the large majority of cases, especially in hospital practice; which is all that can be said in favour of any one form of dressing or plan of treatment.

We feel reluctant to approach the subject of dislocations, with which the second part is so ably and faithfully occupied, because we have not the time to treat it with the respect which is certainly its due, and because we dare not try the patience of our readers any further, after having taxed it so thoroughly in the previous pages.

The best that can be done, to give an idea of the manner in which our author views his task and its requirements, is to quote the following paragraphs on the general treatment of dislocations:—

> "Many dislocations may be reduced promptly by manipulation alone; which mode is always to be preferred when it will prove sufficient, for the reasons that it is generally the least painful to the patient, and the least apt to inflict additional injury upon the muscles and ligaments.
>
> "A person wholly unacquainted with anatomy or surgery may occasionally succeed in reducing a dislocated limb; indeed, it frequently happens that the patient himself, by mere accident in getting up or in lying down, accomplishes the reduction; and even in a very large majority of cases force and perseverance will finally succeed, by whomever they may be employed; but the observing student of surgery will soon discover the difference between accident and brute force on the one hand, and intelligent manipulation on the other. The charlatan bone-setter does not often allow himself to fail, unless the courage of his patient gives out, or he ignorantly supposes the reduction to be effected when it is not; but his success, achieved through great and unnecessary suffering, is often obtained, also, at the expense of the limb. While the surgeon, whose knowledge of anatomy enables him to understand in what direction the muscles are offering resistance, and through what ligaments the head of the bone must be guided, lifts the limb gently in his hands, and the bone seeks its socket promptly and without disturbance, as if it needed only the opportunity that it might demonstrate its willingness to return.
>
> "We must understand not only what muscles and ligaments antagonize the reduction, if we would be most successful, but also what muscles, by being provoked to contraction, will themselves aid in the reduction. In short, to become expert bone-setters in the department of dislocations, one must possess a complete knowledge of the physiognomy or the external aspect of joints, acquired only by repeated and careful examinations, he must be familiar with the anatomy and functions of the muscles, he must understand thoroughly the ligaments, he must have experience, tact, and fertility of resource.
>
> "Without these qualifications he will do better never to undertake to treat dislocations, since he is constantly liable to mistake fractures for dislocations, and dislocations for fractures; he will submit a sprained wrist to violent extensions, under the conviction that the joint is displaced; he will mistake natural projections for deformities, and fail to recognize the real deformity when it actually exists; he will leave bones unreduced, fully believing that they are reduced; and he will, all in all, within a few years accomplish vastly more evil than he can ever do good. Let a man practise any other branch of surgery, if he will, without experience or scientific knowledge, but he must not attempt to reduce dislocated bones. The most learned and the most skilful we shall find falling into error, embarrassed by the uncertainty of the diagnosis, or successfully resisted by the power of the opposing agents; what, then, can be expected of those who are both ignorant and inexperienced, but failures and disasters?" (p. 493.)

It may be said, in a few words, that the particular luxations are methodically discussed in all their aspects of diagnosis, pathology, prognosis, and treatment, with unusual care and fulness, and in the same concise, although generally perspicuous style, which characterizes the other portions of the work. The various questions of theory and practice are richly illustrated with numerous American cases, many of which had been under the personal observation of the author. The chapter on dislocations of the spine is especially interesting in this respect. The various manipulating processes for different dislocations receive a full share of attention. The history of the mode of reducing dislocation of the thigh, in connection with the method and demonstrations of Reid, is very elaborately drawn up, as many of our readers are aware, from having already seen the substance of his remarks on the subject in the journals.

Viewing Dr. Hamilton's work once more, as a whole, there would seem to be a few matters of omission, an occasional want of regard for minuteness of detail, and, in some instances, rather indiscriminate quotations, by which authorities of little value and doubtful cases are cited on equal terms with others of a much higher class. There is little to find fault with, however, in comparison with what is entitled to high praise, and we sincerely congratulate the profession of the United States on the appearance of such a publication from one of their number. We have reason to be proud of it as an original work, both in a literary and scientific point of view, and to esteem it as a valuable guide in a most difficult and important branch of study and practice. On every account, therefore, we hope that it may soon be widely known abroad as an evidence of genuine progress on this side of the Atlantic, and further, that it may be still more widely known at home as an authoritative teacher from which every one may profitably learn, and as affording an example of honest, well-directed, and untiring industry in authorship which every surgeon may emulate. E. H.

ART. XVII.—*The Transactions of the American Medical Association.* Instituted 1847. Vol. XII. Philadelphia, 1859. 8vo. pp. 722.

THE articles comprised in this volume of the *Transactions of the American Medical Association*, are but few in number. By two of the standing committees, those on Medical Education, and on Medical Literature, no reports were made at the session of 1859, and of the long list of committees appointed at previous sessions for the investigation of special subjects, and to prepare histories of the meteorology, and epidemics of the several sections of the United States, from five, only, were reports received.

To insure the efficiency, and to increase the usefulness of the Association as a scientific body, some change seems to be required in the plan of its proceedings. The system now pursued of referring particular subjects for investigation to special committees of one member each, has been found by experience not to be well adapted to elicit a regular series of valuable communications in either of the departments of medical science. It is true that among the reports heretofore made to the Association by its special committees, there are several of a very high character. These reports, however, we suspect, are to be viewed rather as voluntary contributions from their respective authors—with whom the subjects embraced in them had been favourite specialities, upon the investigation of which their minds had been engaged for some time—than as immediate results of investigations originated and accomplished solely at the instance of the Association. It would be better, we are persuaded, were all the committees dispensed with, save, perhaps, the present standing committees, and such as occasionally shall be required for the investigation of any subject that may occur, of especial interest. We believe that the Association could rely, with entire confidence, upon the presentation of valuable voluntary contributions from its members, were its sessions so conducted as to afford sufficient time for the free discussion of the views set forth in such contributions; or were the rule adopted to refer them to suitable committees, to carefully examine them, and report upon their respective merits: no paper presented to the Association, at any of its sessions, being allowed to appear in the printed transactions unless the same has received the favourable verdict of a committee of reference.

How far the interest of the meetings of the Association will be augmented, and the value of its *Transactions* insured by the carrying out of the recommendation adopted at its last session, to divide it into sections, time alone must determine. It is the plan which is already adopted by nearly all other scientific associations, and from this fact we have a right to infer that it has been found to work well.

A concise, but very terse and pointed report on the subject of Criminal Abortion, investigated with a view to its general suppression, is presented by a committee of which Dr. Horatio R. Storer, of Massachusetts, was chairman.

The report denounces, in the most explicit terms, the procurement of abortion, as no trifling offence against public morality and decency—no mere misdemeanor—no unjustifiable risking of the life of a pregnant female for the attainment of some paramount good—but a crime of the most heinous character on the part of all concerned in it; being no less than a wanton and murderous destruction of a living human being; a deliberate taking away of life, justifiable in no instance by any defensible motive, nor counterbalanced by any possible benefit that can result from it under any supposable contingency; but, in all cases, a crime of the first magnitude, deserving of unmitigated detestation.

There can, certainly, be no surer evidence of the moral decadence of a community than the prevalence in its midst of criminal abortion, and the toleration of its acknowledged practitioners. That the crime has fearfully increased of late years in our own country, more especially in all of our larger cities, is shown by the clearest and most incontestable evidence. So venial an offence has the procurement of abortion come to be considered, and so readily obtained are the means for its accomplishment, that it is resorted to daily, not merely by such as would conceal, through its instrumentality, the results of illicit sexual intercourse, but by even the mothers of families, to relieve them from the suffering and confinement incident to childbirth, and from the care, the responsibility, and the expense that would be entailed upon them by a family of children.

The causes of this general demoralization are manifold. While, in many instances abortionism is the legitimate result of preceding sinfulness, from the consequences of which it is adopted as a means of escape; in not a few cases it is resorted to from motives based in utter selfishness—a selfishness so debasing and denaturalizing in its effects, as to render a female willing to sacrifice the fruit of her own womb, and to forego the pleasures—the sweet and holy sympathies of maternity, for no higher object than to administer to her personal ease and comfort; or to enable her to continue without hinderance or restraint in the path of folly.

In the report before us, three of the most important causes of the prevalence of criminal abortion are referred to, as those with which the medical profession have especially to do.

The first is a widespread ignorance of the true character of the crime.

A belief existing, even among mothers, that the fœtus is destitute of life previously to the so-called period of quickening.

The second cause is the popular belief that the medical profession is itself careless of fœtal life. That is, physicians, without being knowingly or intentionally accessary to the crime of criminal abortion, are supposed to be, at times, liable to omit the precautions or means adapted to prevent its occurrence.

The third cause is to be found in the defects of our laws—both common and statute—in their non-recognition of the actual and independent existence of the child before birth as a living being; in consequence of which, conviction for the crime of abortion is prevented in almost every instance. With a strange inconsistency, while the law fully acknowledges the existence of the fœtus in utero, in providing for its civil and pecuniary rights, it fails to recognize it personally and as criminally affected, denying to it any protection from attempts upon its life.

The evil and its leading causes being thus exposed, the duty incumbent upon every honest member of our profession is perfectly plain.

> "If to want of knowledge on a medical point, the slaughter of countless children now steadily perpetrated in our midst, is to be attributed, it is our duty, as physicians, and as good and true men, both publicly and privately, and by every means in our power, to enlighten this ignorance.
>
> "If we have ever been thought negligent of the sanctity of fœtal life, the means of correcting the error are before us. If we have ever been so indeed, there are materials, and there is good occasion for the establishment of an obstetric code, which rigorously kept to the standard of our attainments in knowledge, and generally accepted by the profession, would tend to prevent such unnecessary and unjustifiable destruction of human life.
>
> "If the tenets of the law, here unscientific, unjust, inhuman, can be bettered—as citizens, and to the best of our ability, we should seek this end. If the evidence on this point is especially of a medical character, it is our duty to proffer our aid, and, in so important a matter to urge it. But if, as is also true, these great fundamental, and fatal defects of the law are owing to doctrinal errors of the profession in a former age, it devolves upon us, by every bond we hold sacred, by our reverence for the fathers in medicine, by our love for the race, and by our responsibility as accountable beings, to see these errors removed and their grievous results abated."

The report concludes with recommendation of the following resolutions for adoption by the Association :—

> "*Resolved*, That while physicians have long been united in condemning the act of producing abortion, at every period of gestation, except as necessary for preserving the life of either mother or child, it has become the duty of the Association, in view of the prevalence and increasing frequency of the crime, publicly to enter an earnest and solemn protest against such unwarrantable destruction of human life.
>
> "*Resolved*, That in pursuance of the grand and noble calling we profess, the saving of human lives, and of the sacred responsibilities thereby devolving upon us, the Association present this subject to the attention of the several legislative assemblies of the Union, with the prayer that the laws by which the crime of procuring abortion is attempted to be controlled may be revised, and that such other action may be taken in the premises as they in their wisdom may deem necessary.
>
> "*Resolved*, That the Association request the zealous co-operation of the various State Medical Societies in pressing this subject upon the legislatures of their respective States, and that the President and Secretaries of the Association are hereby authorized to carry out, by memorial, these resolutions."

A most able report on the Medical Topography and Epidemics of California, is from the pen of Dr. Thomas M. Logan, of Sacramento. There are few places which, in respect to the etiology and pathology of disease, present so fruitful and interesting a field for observation, as does California. Remarkable in the configuration of its surface, in its geological conditions, in its varieties of climate, in the character, condition, pursuits and mode of life of the crowds who first flocked there to appropriate its golden treasures, as well as of those who constitute the bulk of its present population, it at the same time presents before our eyes the rapid transition stages which, in this country, occur "between the rudeness of first settlements, and the more refined condition of countries long subject to civilization."

The character of the climate of California, considered in a general manner, may, according to Dr. Logan, be designated as Asiatic. In the greater portion of the State, the temperature, during the summer season, rises in the afternoon, in consequence of the very slight amount of surface moisture and the absence of clouds, as high as it does in districts, on the Atlantic side, ten or twelve degrees further south, and sinks proportionately low during the night; rendering this portion of the twenty-four hours cool and chilly. The year is divided into two seasons—the one dry and the other rainy. The first embracing the months of October, November, December, January, February, March, April, and May; the highest amount of rain falling during the last winter, and first two spring months. The dry season prevails through the months of June, July, August and September, during which but a very slight amount if any rain occurs.

> "Although the thermometer," says Dr. L., "has been known to fall as low as 33° as late as the 10th of February, still, the leafing process generally commences during the first week of February, and is completed at a temperature not much exceeding that of the mean annual. The measure of heat increases very gradually from month to month; indeed, the same uniformity of temperature obtains throughout the meteorological seasons. In summer the greatest vicissitudes of temperature are found to occur. The commencement of autumn is quite similar to the beginning of spring in its mean of daily temperature. The earth remaining warmer than the atmosphere under the decline of temperature, activity is partially renewed, after the drought of summer, by the influence of the light early showers of October. The first frosts occur about the middle of November, and the decline into winter is prolonged until the latter part of December. Ice is seldom formed before the beginning of January, and then rarely remains unthawed for twenty-four consecutive hours."

In a general point of view the climate of California may be pronounced salutary. For those who are possessed of the ordinary comforts of life, and who observe the leading hygienic precautions, there are few locations in which a larger amount of health may be, with certainty, enjoyed. Autumnal fever prevails every year, and, occasionally, as in 1858, to a very great extent—but, usually, of so mild a character and so amenable to treatment, as seldom to terminate fatally.

The causes of disease have heretofore been, according to Dr. L., the combined influence of the peculiar meteorological and physical conditions of the country, modified by temperament. The varieties of disease—as cholera, diarrhœa, typhoid fever, etc.—formerly met with, being entirely referable to the mode of life—the bad hygienic condition of the earlier population. This is shown by the fact that the disappearance of these diseases have corresponded with the increase of the comforts of, and ameliorations generally in the conditions of, the community.

As in all other countries, malarial fever, almost unknown in the early period of its settlement, has developed itself in California with the increased cultivation of the soil, and the general advance of industry and civilization. In other portions of the United States, however, where the prevalence of autumnal fever has followed upon the changes induced by cultivation, it has been the result, usually, of the extermination of forests and the clearing off of the luxuriant primeval vegetation, in consequence of which land that had been previously shielded from the sun's rays, and of course saturated with moisture, has become exposed to their influence. In California, however, districts of country, almost destitute of trees, and naturally arid, have been rendered moist and malarious, in consequence of the copious distribution of water for mining and agricultural purposes.

"From the study of medical topography with reference to autumnal fever in the great Mississippi Valley," we quote from the report before us, "we find, according to Dr. Drake, that it is a safe generalization to conclude that, all other circumstances being equal, fever prevails most where the amount of organic matter is greatest, and least where it is least. In valleys, where it is washed down from the hills, and deposited with the debris of rocks, this substance rapidly augments itself by promoting more luxuriant crops of vegetation. Whereas, in the pine lands of our Southern Atlantic States, it is small in quantity from the sandiness of the surface, just as it is in our desert lands, where the fever is unknown.

"Now, with respect to the Sacramento Valley, we find the amount of organic matter very different in different parts; for its production depends on the fertility of the soil, and on the temperature and moisture. Where these elements are all present, as in the neighbourhood of our rivers, sloughs, and overflowed lands, and their agency is not counteracted by a growth of tulé or other vegetation—there we always find more or less of fever every year; indeed, it is an endemic of such localities. Especially do we find the disease most constant along those river courses, whose turbid waters, being confined in the dry season within narrow bounds, leave a great part of their channels uncovered, and thus expose an immense amount of deposit brought down from the washings of the auriferous soil—as the Yuba, the Feather, and the American rivers and their tributaries. There are, however, regions of our valley where the loose upper stratum consists chiefly of the debris of rocks beneath, or of the deposits of the debris of other rocks spread over the surface by ancient inundations, and likewise tracts in which the rocks themselves appear at the surface, and from the general declivity of the land, the organic matters are washed off by the rains of winter, into the innumerable ravines and channels of creeks and rivers with which the face of the country is diversified, and which becoming dried up in summer, the whole region has remained perfectly healthy. Since, however, the introduction of water for mining purposes—the digging of ditches, the building of dams, and the establishment of large reservoirs—we find these very regions subjected to the disease; and this, too, we find to be in perfect accordance with all that has been observed in every part of the globe where intermittents prevail. For it appears necessary to the production of the efficient cause, be it malaria or whatever we please to term it, that there should be a surface capable of absorbing moisture, and this surface should be flooded and soaked with water, and then dried; and the higher the temperature, and the quicker the drying process, the more powerful—more probably because more plentiful—is the effect. Hence the conclusion is legitimate, that decaying organic matter brought and deposited in various directions, in a condition and under circumstances most favourable to decomposition, has been instrumental in occasioning the late epidemic (that of 1858) in California. As to the mode in which this decaying organic matter co-operates with the other essentially necessary conditions, heat and moisture, in the production of the morbific effect, we have no positive knowledge, nor would the discussion of the various hypotheses that have been framed in relation thereto, inure to any practical good. It may supply the material out of which a poisonous gas is formed, as maintained by some, or it may prove a nidus or hot-bed for animalcules, or vegetable germs, according to the theories of others. In either case, we know the conditions that are necessary to give it efficiency. As long as these conditions coexist, certain effects are produced; interrupt, counteract their coefficiency, and the probability is we may never afterward hear of such another wide-spread epidemic as (that of 1858) we have been studying in its etiology."

In the course of the history given in the report before us of the epidemic of intermittent fever which, in the autumn of 1858, prevailed so extensively throughout California, Dr. Logan presents some judicious remarks in relation to the character and management of the disease, which will apply equally to malarial fevers generally, wherever these prevail annually as wide-spread endemics. There is nothing, it is true, in the remarks of Dr. L. that can be considered as particularly novel; they reveal no new facts in reference to the pathology of these affections; no development of any new therapeutical plan or means for their treatment; they, however, recall attention to principles and rules of practice that had become in a great measure forgotten, if not entirely ignored.

We pass by the report which follows, "On a Uniform Plan for Registration Reports of Births, Marriages, and Deaths," by Dr. W. L. Sutton, of Kentucky, as we have already one which occurs previously, "On Government Meteorological Reports," prepared by Dr. Richard H. Coolidge; not because of any want of interest or of value in these reports, but from the impossibility of presenting any satisfactory summary of either of them. The views presented in both appear to us judicious, and adapted, if carried out, to secure a valuable series of statistics. We would press the report of Dr. Sutton more especially upon the attention of the members of the profession generally. They having the power within their own hands of inaugurating in every portion of the United States a registration of births, marriages, and deaths, in accordance with the plan recommended by its author.

The next report in order is "On the Topography and Epidemic Diseases of Michigan." It is from the pen of Dr. J. H. Beech.

In respect to its medical topography, Dr. B. divides the State of Michigan into three sections. The first embracing the northern peninsula. This district has a climate whose salubrity renders it an admirable resort for that class of invalids in whom the depressing influences of heat and humidity have so far deranged the digestive and assimilative organs, as to lay them open to the attacks of acute disease when they remain exposed to the annual changes which occur in the lower latitudes and inferior altitudes. The dryness of the atmosphere in this district has been noticed by every observer. Malaria is there unknown, and the summer solstice never brings with it its enervating blight. The only epidemic visitation experienced by the white inhabitants, of which Dr. B. has obtained information, was that of typhus fever, which, according to the statements of Dr. Pitcher, prevailed at Fort Brady, in the years 1826 and 1827.

The second of the three sections referred to by Dr. B. includes that portion of the southern peninsula of Michigan which lies north of the valley of Au Sable and the Manistee River. This section, we are told, is but little inferior to the former in point of salubrity. The atmosphere is usually dry, while the temperature is not high, excepting under the direct rays of nearly the mid-day sun. The character of the diseases which occur in this second section, and the season of their greatest prevalence, correspond in some degree with those of the distinctly malarious regions. Aside from the charms of the scenery about Lake Superior, and the conveniences of sojourn, it is very probable, Dr. B. remarks, that it is a more desirable residence for invalids than the northern peninsula.

The third section, according to the division suggested by the reporter, comprises the middle and southern portions of the State. It borders closely upon the epidemic zone, although still beyond the range of the more destructive of the epidemic maladies.

> "A rich alluvial soil, a large portion of which is deeply covered with an exceedingly porous vegetable mould, and watered or drained by streams but slightly below the general level of the country, affords unquestionably sources of humidity at temperatures in summer, which favour decomposition less rapid, it is true, but equally certain as in the torrid zone."
>
> "Scarcely a stream exists in the southern portion of the State, which does not in every few miles of its course widen into a lakelet of several hundred acres, skirted on one or more sides by savannas which might diversify and adorn the landscape without noxious influence, if properly cleared and drained; but which too frequently have been inundated by a mill-dam at the *debouche*, converting the semi-aquatic trees and grasses into vast rotten quagmires, to be left uncovered and seethe in the summer's sun, germinating diseases, like Python of Egyptian fable, to encircle its sallow victims in folds of endemics and epidemics."

We have already mentioned the endemics of typhus fever described by Dr. Pitcher as occurring at Fort Brady in the years 1826 and 1827.

> "In these two epidemics there were most dissimilar atmospheric conditions. The first visited a section proverbially healthy, intensely cold weather prevailing, and neither want nor other depressing causes being known, nor any possibility of importation. The latter in a humid locality, in a hot summer, and among a portion of population imperfectly cared for, in a city whose accommodations were certainly not at that time above the demands of necessity."

Dr. Bailey describes an epidemic of a typhoid character, which prevailed chiefly among children, in Lapeer County, in 1841, and another which prevailed among the population generally throughout the middle and southern portions of the State in the year 1848. A similar fever is noticed by Dr. Peyry, of Washtenaw County, as having prevailed in Northfield and Saline during the spring of 1855. In various other parts of the State typhoid fever is described as having occurred in different years under certain anomalous forms. The description furnished us of the general characteristics presented by the fever, as it appeared in these epidemic visitations, would lead us to suspect that the disease described as typhus fever was, in some of them at least, the affection known as cerebro-spinal meningitis. That it bore all features of the latter, in certain localities, is admitted by Dr. Peyry in his account of the epidemic observed by him.

Dr. Bailey notices a severe and fatal epidemic that prevailed in different portions of the State during the early period of 1848, but especially in Almont and Detroit.

> "The winter," he says, "was an 'open one,' there being a thaw every fourteen days, when what little snow had fallen would melt off, leaving the ground wet. As soon as the wind commenced blowing from the south every one would begin to complain of chilliness. On exposure to the wind, a sense of coldness would pervade the whole body, attended with a peculiar sensation in the nape of the neck, producing an inclination to draw the head back. A person would feel, only to a greater degree, all the symptoms usually called 'aguish.' Attending this coldness was a cool, clammy sweat, especially on the lower limbs, and severe pains from the knees down."

If nothing was done to remedy this state of things, within twenty-four hours a severe pain began to be felt in some part of the body, generally in a joint—as of the great toe, the knee, the hip, etc.—which was soon followed by intense headache, great coldness of surface, redness of eyes, rigors, and other indications of great depression. The pulse became sluggish, and slower than natural—it was rather full in some cases, but always easily compressed; the tongue was pale or of a leaden hue, and spongy or flabby, but seldom coated. In most cases reaction took place within a few hours. Occasionally the patient would sink into a comatose state, and die under all the appearances of compression of the brain. The amount of febrile excitement which succeeded the cold stage was proportionate to the intensity of the latter. It usually passed off in a few hours with a profuse sweat, leaving the patient free from pain, but much debilitated. If the course of the disease was still uninterfered with by remedial measures, after from twelve to twenty-four hours another chill would occur, and be succeeded by reaction as before, attended with delirium and other more severe symptoms than the previous exacerbation. This would go off with perspiration; and if the proper remedies were still withheld, a third paroxysm would occur at an interval six hours less than the first. With few exceptions, death took place upon the occurrence of this third paroxysm.

In many cases the symptoms of the first paroxysm were so slight as to induce the patient to consider them of trifling importance, no uneasiness being experienced by him until upon the occurrence of a second paroxysm. During the latter, delirium and all the phenomena observed in cases of congestion of the brain would usually supervene, such as dilatation of the pupils, strabismus, convulsions, and in some cases a firm contraction of the muscles of the spine and those on the posterior portion of the lower limbs, causing the body to become bent backwards in the form of an arch, the occiput and heels alone touching the bed as the patient lay upon his back. Occasionally the spasmodic symptoms resembled those of chorea or of opisthotonos. After a third paroxysm, uniformly, the congestive symptoms became permanent, or only interrupted occasionally by an exacerbation of the convulsive phenomena, occurring at some particular portion of the twenty-four hours, usually at night. There was little derangement detected of the stomach or the other assimilative organs on the first attack of the disease; subsequently, however, constipation set in, with scantiness of urine and of the other secretions. Puerperal females, we are told, were especially liable to be attacked by the epidemic during the winter season. The initial chill was generally experienced about the third day after confinement. So common an occurrence is a more or less decided chill at this period, when the secretion of milk commences, that at first its serious import was overlooked, and, the true character of the case not being understood, a second chill would be allowed to ensue, accompanied by all the formidable phenomena indicative of cerebral disease.

The degree of severity, both in the attack and subsequent symptoms, varied in different cases, according to the age, sex, temperament, and previous habits of the patient. The disease attacked most usually individuals of adult age, of the male sex, and who were exposed to vicissitudes of weather, and of irregular habits.

Examination after death revealed effusion into the ventricles of the brain, with pus in the points where the extravasation first took place, which was at the base of the brain, but generally lying upon the cerebellum at different places. Dr. B. states that it was impossible, in any case he examined, to determine the exact spot where the lesion occurred. The spinal cord does not appear to have been examined.

When cases of the disease came early under treatment, they yielded readily to simple remedies. Usually the patient was covered up in bed, with sinapisms to the ankles, calves of the legs, and inside of the thighs. Hot bricks wrapped in wet cloths were applied around different parts of the body, particularly of those places where severe pain was experienced, and bladders containing snow or powdered ice upon the head and back of the neck. As soon as the extremities became warm, and the circulation equalized, the patient would experience relief, and commence to sweat. Quinine, combined with opium, capsicum, or other remedy indicated by the particular symptoms and circumstances of each case, was given to the extent of from thirty to sixty grains, in doses of from five to ten grains every two or three hours, until the period of the night paroxysm had passed. In cases attended with collapse, brandy and other stimulants were required to be given freely. It was generally found advisable to apply warmth to the extremities, and employ other means to prevent a second attack, half an hour or more before it is expected to occur. When alteratives were indicated, they were combined with the antiperiodic remedies, or withheld until the paroxysms were suspended. In most cases, during the first thirty-six or forty-eight hours the tongue was clean and pale, and no vomiting or other derangement of stomach was observed; but subsequently, in some cases, the tongue would become coated, or red and dry, when the case was treated on general therapeutic principles.

> "It was a common thing," says Dr. B., "to meet people in the street complaining of the peculiar coldness and pain in the neck above mentioned, and in such cases we were in the habit of prescribing quinine, thirty grains, divided into six doses, combined with capsicum or piperine, one to be taken every two hours, with as much brandy as could be borne without affecting the head—and it was astonishing how much could be taken without producing intoxication.
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> "Bleeding was tried in two cases attended with congestion of the brain, but with bad rather than good effect. The only hope of saving the life of the patient was to get the disease under control before the occurrence of the second paroxysm."

The State of Michigan has always sustained a high reputation—and, Dr. B. is convinced, deservedly so—as a residence for such as possess a decided predisposition to phthisis pulmonalis. It has been repeatedly remarked, and the truth of the observation is confirmed by the experience of Dr. B., that individuals from the Eastern and Middle States, of marked hereditary or acquired tuberculous diathesis, usually resist the encroachments of the malady while residing in Michigan to a much greater degree than before immigration, or than members of their own families who remain at home. They would appear also less liable to transmit the tuberculous taint to their offspring.

> "With full conviction," remarks Dr. B., "of the general correctness of the conclusions of Dr. Drake, in his work on 'the Diseases of the Interior Valley of North America,' we have not found his opinions in regard to the effect of colder regions upon consumptives, substantiated by the reports of invalids, except where the effect of purulent absorption, or other depressing influences, were diminished for a time, through the additional vigor given to the circulation by a journey, and the early periods of sojourn in Lake Superior regions. Tuberculous patients returning to the southern portions of the State from there, appear to have declined rapidly after the excitement of new scenes had passed; and, although the dryness of the atmosphere would render insensible, and undoubtedly diminish the perspiration which had bathed the skin in more humid climates, and the appetite generally improves, still the cough often became more irritating, and pleuritic pains more troublesome, sometimes demanding a hasty retreat."

The fact of the extreme infrequency of pulmonary tuberculosis, indeed of tuberculosis generally, among the inhabitants of cold, dry, equable climates, is incontestably established by a series of the most reliable statistics collected by different observers, within the past few years, and many striking and well-authenticated facts would even seem to indicate that, in individuals who are strongly predisposed to tuberculosis, a residence in a climate as we have just described, will so far ward off the occurrence of pulmonary consumption as to enable them to pursue without impediment any active occupation, their lives being extended to the ordinary limits of human existence. But we have no reason for supposing that a cold climate, however dry and equable, would prove a proper one for patients who are actually labouring under pulmonary consumption. With the views we entertain in respect to the pathology of pulmonary consumption, we should anticipate that an increase rather than a diminution of the disease would be caused by the removal of the patient in whom it had already developed itself from a mild, warm, or even hot climate, into a cold, although equable and dry climate, though we believe that the evil influence of such a climate would be far less than that of a cold, damp, variable one.

The only paper which remains to be noticed is one by Dr. Joseph Jones, of the Medical College of Georgia, entitled, "Observations on some of the Physical, Chemical, Physiological, and Pathological Phenomena of Malarial Fever." It is a production of very large pretensions, extending over a wide, almost limitless field of inquiry; and occupying upwards of four hundred pages of the present volume of *Transactions*.

It would be impossible, even if we were inclined to enter upon the task, to do justice to a theme so vast as that discussed by Dr. Jones, in a review or analysis of any reasonable limits. His first chapter, alone, which treats of the relation of man to the exterior universe—the relations of astronomical, terrestrial, physical, chemical, and physiological phenomena, and the character and extent of physiological and pathological investigations established by the relations of man to the exterior universe, opens out before us a field of inquiry so extensive, and intricate, that even a superficial glance at its leading propositions, and the facts and reasoning upon which they are based, would extend our notice far beyond all reasonable limits.

The essay of Dr. Jones is unquestionably, upon the whole, a very able and instructive one. Some few of the general propositions of the author can be viewed, it is true, in no other light than as mere truisms, dressed up in a somewhat new phraseology, and most diffusively set forth; while others are but of doubtful accuracy, and several are expressed in terms too loose and indefinite to convey any clear and positive idea.

The foregoing remarks apply more especially to the general matter contained in the first three chapters. Those portions of the essay which treat of the changes the blood undergoes in malarial fever—the pathological anatomy of the several types of this disease—the comparison of the morbid changes detected after death, with the phenomena presented by the disease during the life of the patient, with similar changes in other maladies, and with the condition of the diseased organs, tissues, and apparatus in the normal state, are marked by a closer process of reasoning; the conclusions being sustained, also, by a series of more pertinent, positive, and definite observations. In the elucidation of the important questions embraced in the three concluding chapters of the essay, it must be confessed that Dr. Jones has exhibited no common ability, and not a little research; every portion of these chapters is marked by extended and careful observation, and, in most instances, by a spirit of cautious induction. They are throughout most interesting and instructive. Although we cannot give assent to the accuracy of all the premises assumed by the author, nor to the entire legitimacy of all his conclusions, yet we feel very confident that no one can rise from the attentive study of the essay without having acquired a better knowledge of the pathology, generally speaking, of malarial fever than he before possessed.

We shall not pretend to offer an analysis of the several premises which Dr. J. believes that he has established, nor can we attempt to follow him in the course of reasoning by which he is led to the pathological conclusions he advocates. The utmost we can do is to present a general summary of the more prominent of his leading conclusions, and as far as possible in his own words.

In relation to the changes the blood undergoes in malarial fever, Dr. J. believes that the observations he has adduced prove its coloured corpuscles, together with its albumen, to be diminished, whilst the extractive matters of the serum are increased, and that the extent and rapidity of these changes correspond with the severity and extent of the disease. The destruction of the coloured blood-corpuscles being more uniformly observed and more rapidly accomplished in malarial fever than in any other acute affection. The destruction is effected mainly in the liver and spleen. The fixed saline constituents of the blood-corpuscles, also, are shown, according to Dr. J., by the same series of observations, to be often diminished in malarial fever. The alteration and destruction of the coloured blood-corpuscles are invariably attended, Dr. J. affirms, by aberrated muscular and nervous action.

The destruction of its coloured corpuscles is not the only change the blood undergoes in the liver; Dr. J. has found that during malarial fever animal starch accumulates in that organ, whilst there is at the same time an absence of grape sugar.

In malarial fevers, and in fever generally, he remarks, the fibrin of the blood is rarely increased. It either remains within its normal limits, or is diminished in quantity. So far as his observations extend, the amount of the diminution of the fibrin corresponds with the severity of the disease.

These changes in the blood, and the resulting modifications in the constitution of the solids, Dr. J. believes to take place in those who have been subjected to the morbific influence of the malarial poison, before any of the phenomena constituting the disease termed fever have developed themselves—to a sufficient extent to attract attention—constituting what he denominates the malarial cachexy. He denies that, in malarial fever, the cerebro-spinal system is the seat of irritation or of inflammation, provided these terms be limited to the meaning commonly adopted; but that when irritation and inflammation of the cerebro-spinal system do occur in the progress of the fevers referred to, they are strictly accidental phenomena, and by no means dependent upon the definite and uniform action of the malarial poison.

The following is the rationale, according to Dr. J., of the phenomena which constitute a paroxysm of malarial fever as exhibited in its most common and regular form, that of an intermittent:—

"The poison, as we have demonstrated in the chapter on the blood, first alters the constitution of the blood, and interferes with the actions and secretions of those organs which elaborate the blood, before producing any perceptible changes in the phenomena of either the sympathetic or cerebro-spinal systems, this alteration of the blood progresses until a point is reached, where either such compounds are generated in the cycle of chemical changes, induced by the malarial poison, or the constituents of the blood, especially the coloured blood-corpuscles and fibrin, become so altered that disturbances are produced in the chemical changes by which the capillary circulation is maintained, and as a necessary consequence, the action of the heart, which depends as all other muscular actions do, upon the chemical changes in the capillaries, is impeded, and the blood generally stagnates in the capillaries, and accumulates in the large bloodvessels of the trunk and internal organs, and the temperature of the extremities, due to the chemical changes of the blood in the capillaries and the surrounding tissues, sinks far below the normal standard; this arrest of the capillary circulation in the extremities, and probably also, in the lungs, is attended by the retention of the products of excretion, as carbonic acid, and the matters thrown off from the skin and kidneys; these excrementitious offending matters, together with the products resulting from the perverted chemical changes, due in part to the reduction of the temperature of the extremities many degrees below the normal standard, stimulate the sympathetic and cerebro-spinal nervous system; the sensation of cold is felt, attended by twitching and jumping of the muscles, entirely beyond the control of the will, because they are due to aberrated muscular and nervous action, arising from disturbances in the capillary circulation, and from the action of the perverted elements of the blood, the respiration is aroused, more oxygen is introduced, and the temperature of the trunk elevated, provided the alterations in the constitution of the blood have not proceeded too far, or the nervous system been so overwhelmed, either by the action of the altered products, or of the malarial poison, that they cannot respond to the excitation produced by the altered and retained productions; the elevation of the temperature of the trunk is attended by more rapid circulation of the blood in the capillaries of the heart and of the nervous centres, and consequently by a more rapid and powerful action of the heart and generation of nervous force, the oxygen is introduced and distributed with greater rapidity, the chemical changes in the capillaries are again excited, the capillary circulation is first restored in the trunk, and then in the extremities, the elevation of temperature becomes general, and we have the phenomena called fever."

During the active chemical changes of fever, the malarial poison and the altered products of the blood are drawn into the round of chemical change, physically and chemically altered, and are finally thrown off from the lungs, skin, kidneys, and intestinal canal. After the removal of these offending products, the excitants of the sympathetic and cerebro-spinal system, after the system has been purified, as if by fire, then the nervous system returns back to the normal exercise of its functions; the force and frequency of the heart diminish; the panting, full respiration subsides into the calm regularity of health; the temperature, both in the trunk and in the extremities, returns to the normal standard, and we have what is called the remission of fever.

"If remedies have been applied which effect the permanent alteration, and destruction, and removal of the malarial poison, there is no return of the chill, succeeded by fever. If, on the other hand, the poison has not thus been removed, the same round of phenomena is repeated, the blood is again altered, the capillary circulation is again retarded, and the whole round of phenomena are repeated."

The changes that take place in the colour of the liver during malarial fever, is referred, by Dr. J., to changes in the amount and physical and chemical constitution of the blood in the capillaries of the organ, and to the physical and chemical changes in the bile, and the contents of the secretory apparatus.

Alterations of the spleen are laid down by Dr. J. as among the very first of the pathological effects of the malarial poison, and previously to the development of the phenomena constituting the febrile paroxysm. The alterations consist chiefly in the engorgement of the spleen with blood, the softening of its texture, and rupture, in many places, of the trabeculæ.

The following propositions are laid down by Dr. J. in reference to certain phenomena characteristic of the several forms of malarial fever.

"I. During the cold stage (*chill*) there is a rapid, feeble pulse, full, rapid respiration, and a hot trunk and cold extremities.

"II. During the cold stage, the temperature of the extremities is reduced far below that of the trunk, and even below the standard of health, because the circulation of the blood in the bloodvessels and capillaries is feeble.

"III. The diminution of the capillary circulation and reduction of the temperature of the extremities, precede the aberrated nervous and muscular phenomena denominated chill.

"IV. The higher the temperature of the trunk during the cold stage, the more rapid will be the equalization of the circulation and temperature.

"V. The higher the temperature of the trunk during the cold stage (stage of equalization of the circulation and chemical action), the milder and shorter will be the attack as a general rule, provided there be no complication, as congestion of the brain.

"VI. In malarial fever there is a close relation between the state of the skin, pulse, respiration, and temperature of the extremities and trunk.

"VII. The phenomena of the cold stage, preceding the hot stage of *remittent* fever, are similar to those of the cold stage of intermittent fever.

"VIII. The most important difference between the cold stage of *remittent*, and that of *intermittent* fever, is a difference of degree and not of kind, the phenomena of the cold stage of *remittent* fever, are more protracted than those of *intermittent* fever, the sympathetic system is not so rapidly aroused, and the circulation in the capillaries of the extremities is not so rapidly restored in *remittent* as in *intermittent* fever.

"IX. In *remittent* as in *intermittent* fever, the increase of the action of the pulse and respiration is attended by an elevation of temperature, and the elevation of temperature corresponds more accurately with the increased actions of the circulatory and respiratory systems in *intermittent* than in *remittent* fever—that is, the pulse and respiration are more accelerated in *remittent* fever, whilst the temperature does not rise higher than that of *intermittent* fever.

"X. The elevation of the temperature is more persistent in *remittent* than in *intermittent* fever.

"XI. The pain upon pressure of the epigastrium is more acute, and the vomiting more obstinate, and the cerebral symptoms more common and dangerous, in *remittent* than in *intermittent* fever.

"XII. The secretions of the mouth are more completely checked, and the tongue is drier, redder, and rougher to the feeling, in *remittent* than in *intermittent* fever.

"XIII. The glowing tongue of *remittent* fever is not an index of inflammation.

"XIV. The secretions of the salivary glands and mucous membrane of the mouth, are not only more diminished, but they are also more perverted in *remittent* than in *intermittent* fever. The acidity of the saliva is greatest in *remittent* fever.

"XV. The coma, delirium, and severe pain in the head, so often present in the severe cases of *remittent* fever, are, as a general rule, not indicative of inflammation of the brain, but of the stagnation of the blood and perversion of the chemical changes in the capillaries of the brain, and of the action of the altered blood upon the nervous elements, and of the direct action of the malarial poison upon the nervous structures.

"XVI. The changes of the urine in *remittent* fever are the same in kind, but different in degree from those of *intermittent* fever.

"XVII. The malarial poison may produce such profound alterations in the blood, and such profound impressions upon the sympathetic and cerebro-spinal systems, and upon the fibres of the heart, that both the capillary circulation and the general circulation will be greatly deranged, the chemical changes in the capillaries and organs from which the nervous and muscular forces are developed arrested, and the temperature of the trunk diminished.

"XVIII. The malarial poison may produce such derangements in the blood and its containing vessels that fibrinous coagula will be formed in the heart and large bloodvessels, and produce suddenly and without previous warning the phenomena denominated congestive.

"XIX. The action of drastic purgatives, or of an emetic, or profuse bloodletting, may act in conjunction with the malarial poison, and induce phenomena denominated congestive, pernicious, or malignant.

"XX. There is always a want of co-ordination between the actions of the circulation and respiration and animal temperature in congestive fever.

"XXI. The phenomena of congestive fever differ from those of the cold stage of intermittent and remittent fever in the want of elevation of the temperature of the trunk.

"XXII. The phenomena of congestive fever are due to depression of the fever, and not to excitation, and should be treated accordingly."

As a general rule, Dr. J. has found the uric acid of the urine to be either normal in amount or diminished in the active stages of malarial fever, and that the amount increases during convalescence.

The chemical pathology upon which Dr. J. bases his theory of the action of the malarial poison on the animal organism, and in the production of periodical fevers, is extremely attractive from its simplicity and the apparently easy and consistent explanation it gives of the efforts of the vital forces of the system to restore to the blood and to the solids their normal condition, and through these to the sympathetic and cerebro-spinal system its healthful functions. It still remains to be proved, however, that the first act of the malarial poison is the production of "chemical changes in the elements of the blood and organs different from the chemical changes of health," and that the abnormal condition of the fluids and solids of the body, thus induced, by stimulating the sympathetic and cerebro-spinal system, arouses those functions to increased energy, which, by their action, are adapted to bring about again the normal chemical changes of the living organism, and to cause a modification of, and the elimination from the body of the malarial poison itself, and of the abnormal products of the blood which had been produced by its presence.

Dr. J. admits that his series of observations on the subject of malarial fever, notwithstanding they have cost him three years' labor and study, based upon the careful observation of more than three hundred cases of the several forms of malarial fever, as they are met with in different portions of the State of Georgia, are incomplete; he claims for them, in fact, no higher character than as mere beginnings in the right direction; and in this light we have no objection to accord to them a most favourable reception, joining, at the same time, earnestly in the hope expressed by the author that the entire series of observations, and the statements, relations, and laws deduced from them, may be tested by careful, conscientious observers, in order that the errors they may be found to contain may be eliminated, their imperfections removed, the results to which they legitimately lead enlarged, and, in this manner, "the positive knowledge of the phenomena of malarial fever, and of all fevers, established by observation, experiment, and reason." D. F. C.